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Examiner: S. Mulpuri Case: Sacher II-Div

SN: 09/263,481 Filed: 08/March/1999

Art Unit: 2012

Inventor(s): Dr. Joachim Sacher

Title: COATING PROCESS AND APPARATUS

Hon. Commissioner of Patents and Trademarks January 19, 1999

Washington DC 20231

Dear Sir:

PRELIMINARY AMENDMENT

Please amend the present application as follows:

In the Specification:

Amend page 5, second paragraph as follows:

In a particular embodiment, the method for producing AR layers is based on in-situ observation of the light emitted from the front facet and/or the rear facet of the laser diode, the electric voltage at the p-n junction of the laser, or the quantum efficiency of the laser light emitted from the front or rear facet of the laser, or of the threshold current of the laser. The method requires that the thickness of the AR layer is determined by the value changes of a laser parameter as observed in situ. The

measurement values determined in-situ are compared, for example, with the theoretical values according to equation (1) or equation (2) and, herefrom, the thickness of the respective partial layer is directly determined. This highly efficient procedure does not only omit the need for expensive and complicated measuring apparatus such as in-situ ellipsometer, but improved results are obtained since the laser to be coated is itself used as measuring instrument. The present invention permits the manufacture of antireflection coatings in large numbers and with the highest quality. The new process is not only applicable to the thickness of the previously applied layer; rather, the process according to the invention can also be used with any partial layer particularly by plotting a time behavior comparison.

In the Claims:

Cancel claims 1 to 13.

Please amend the following claims as follows:

14. An apparatus for coating at least one of the front and rear facets of semiconductor laser diodes (lasers) with an anti-reflection layer of minimal rest reflectivity while monitoring, in-situ, at least one of laser parameters including laser light emitted from at least one of the front and rear facets of a laser, the electric voltage at a p-n junction of the laser, the quantum efficiency of the laser light emitted from at least one of the front and rear facet of the laser, and the threshold current of the laser, said apparatus comprising a receiver for containing lasers to be coated, a coating source disposed in said receiver, a support structure for supporting said lasers to be coated

such that said lasers are supported with their facets all at essentially the same distance from said coating source, and at least one shutter supported in said receiver so as to be movable selectively in front of at least one of said lasers to protect it from further coating.

15. An apparatus according to claim 14, wherein said lasers are supported on a support structure forming a magazine by which they can be moved into, and out of, said receiver.

Attached hereto is marked-up version showing the changes made to the specification and the claims by the current amendment. The attached page is captioned **"<u>Version with markings to show changes made</u>".**

Respectfully submitted.

Klaus J. Bach. 26832

Version with markings to show changes made

Page 5, second paragraph:

In a particular embodiment, the method for producing AR layers is based on in-situ observation of the light emitted from the front facet and/or the rear facet of the laser diode, the electric voltage at the p-n junction of the laser, or the quantum efficiency of the laser light emitted from the front or rear facet of the laser, or of the threshold current of the laser. The method requires that the thickness of the AR layer is determined by the value changes of a laser parameter as observed in situ. The measurement values determined in-situ, are compared, for example, with the theoretical values according to equation (1) or equation (2) and, herefrom, the thickness of the respective partial layer is directly determined. This highly efficient procedure does not only omit the need for expensive and complicated measuring apparatus such as in-situ ellipsometer, but improved results are obtained since the laser to be coated is itself used as measuring instrument. The present invention permits the manufacture of antireflection coatings in large numbers and with the highest quality. The new process is not only applicable to the thickness of the previously applied layer; rather, the process according to the invention can also be used with any partial layer particularly by plotting a time behavior comparison.

Claims 14 and 15:

14. An apparatus for coating at least one of the front and rear facets of semiconductor laser diodes (lasers) with an [antire-flexion] anti-reflection layer of minimal rest reflectivity while monitoring, in-situ, at least one of

laser parameters including laser light emitted from at least one of the front and rear facets of [the] a laser, the electric voltage at a p-n junction of the laser, the quantum efficiency of the laser light emitted from at least one of the front and rear facet of the laser, and the threshold current of the laser, said apparatus comprising a receiver for containing [at least one laser] lasers to be coated, a coating source disposed in said receiver, a support structure for supporting said lasers to be coated such that said lasers are supported with their facets all at essentially the same distance from said coating source, and at least one shutter supported in said receiver so as to be movable selectively in front of at least one of said lasers to protect it from further coating.

15. An apparatus according to claim 14, wherein said lasers are supported on a support structure forming a magazine by which they can be moved into, and out of, said receiver.